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AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

Serial Number: 10/081,307

Filing Date: February 20, 2002

Title: COMMUNICATION DEVICE WITH DYNAMIC DELAY COMPENSATION AND METHOD FOR COMMUNICATING VOICE

OVER A PACKET-SWITCHED NETWORK

Assignee: Intel Corporation

IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method of receiving packet-switched voice communications over a non-dedicated wireless communication channel comprising:

receiving at least an initial portion of speech packets at a transmission rate exceeding a speech encoding rate;

decoding the speech packets at a rate exceeding the speech encoding rate; and generating speech signals from processing the decoded speech packets at a varying rate, to generate the speech signals being representative of the initial portion of speech packets, the speech signals and having a shortened time period which at least in part compensates for a channel reallocation delay,

wherein generating the speech signals at the varying rate comprises: initially generating speech signals at a rate exceeding the speech encoding rate; and decreasing the rate of generating the speech signals to approximately the speech encoding rate.

2. (Currently Amended) The method of claim 1 wherein processing includes processing the decoded speech packets at a processing the varying rate which initially exceeds the speech encoding rate[[,]] and is decreased decreasing the processing rate gradually to approximately the speech encoding rate, and

wherein the varying rate of generating the speech signals is initially greater than the speech encoding rate to compensate at least in part for the channel reallocation delay.

3. (Currently Amended) The method of claim 1 further comprising buffering the decoded speech packets in a buffer, and

wherein processing generating includes retrieving the decoded speech packets from the buffer at [[a]]the varying rate which initially exceeds the speech encoding rate, the varying rate gradually being gradually decreased to approximately the speech encoding rate.

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4. (Currently Amended) The method of claim 1 wherein processing generating includes processing the decoded speech packets with a dynamic time warping process to generate speech signals representative of the initial portion of speech packets, the generated speech signals spanning a shorter time duration than the initial portion of speech packets and having substantially preserved pitch attributes of the initial portion of speech packets, and

wherein the dynamic time warping process compensates for an increased pitch resulting from initially generating the speech signals at the rate exceeding the speech encoding rate.

- 5. (Original) The method of claim 1 wherein the decoding is performed at approximately the transmission rate.
- 6. (Currently Amended) The method of claim 1 wherein the initial portion of speech packets is buffered for the channel reallocation delay until a <u>wireless communication</u> channel through [[an]]a wireless access medium is granted, and

wherein the initial portion of speech packets is sent in response to the channel being granted, the channel having a channel bandwidth exceeding the speech encoding rate.

- 7. (Currently Amended) The method of claim 6 wherein the <u>wireless communication</u> channel has a channel bandwidth <u>that</u> is approximately proportional to an inverse of the channel reallocation delay.
- 8. (Currently Amended) The method of claim [[1]] 2 wherein the speech packets are received through [[an]]a wireless access medium-that includes at least one of a wireless communication medium, a fiber optical medium, and a conductive wired medium.
- 9. (Currently Amended) The method of claim [[8]] 1 wherein when the access medium is a fiber optical medium, at least one of wavelength division multiplexing, frequency division multiplexing and time division multiplexing is employed the speech signals correspond to actual audio signals that are to be heard by a person listening.

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10. (Currently Amended) The method of claim 8 wherein when the wireless access medium employs is a wireless communication medium, at least one of spread-spectrum multiplexing, frequency-division multiplexing or and time-division multiplexing is employed.

11. (Currently Amended) A <u>wireless</u> communication device <u>for communicating packetswitched voice communications</u> comprising:

a voice decoder to decode speech packets, at least an initial portion of the speech packets being delayed by a channel reallocation delay;

a buffer to store the decoded speech packets; and

a processing element to generate speech signals from process the decoded speech packets at a <u>varying</u> rate <u>initially</u> exceeding a speech encoding rate <u>to compensate at least in part for the channel reallocation delay, wherein the and to generate</u> speech signals <u>are</u> representative of the initial portion of the speech packets <u>and have</u>, the speech signals having a shortened time period, which compensates at least in part for the channel reallocation delay

wherein the processing element decreases the rate of generating the speech signals to approximately the speech encoding rate.

- 12. (Currently Amended) The <u>wireless</u> communication device of claim 11 wherein the communication device receives the initial portion of the speech packets at a rate exceeding the speech encoding rate, and the voice decoder decodes the initial portion of the speech packets at a rate exceeding the speech encoding rate.
- 13. (Currently Amended) The <u>wireless</u> communication device of claim 11 wherein the initial portion of the speech packets are buffered for a time approximating the channel reallocation delay prior to transmission through an access medium, wherein the channel reallocation delay includes time to grant a channel through the access medium.
- 14. (Currently Amended) The <u>wireless</u> communication device of claim 11 wherein the processing element processes the decoded speech packets at a processing rate which initially

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exceeds the speech encoding rate and which is gradually decreased to approximately the speech encoding rate.

15. (Currently Amended) The wireless communication device of claim 11 wherein the processing element retrieves the decoded speech packets from the buffer at a rate which initially exceeds the speech encoding rate to initially generate the speech signals at a rate exceeding the speech encoding rate, and

wherein the processing element gradually decreases the rate of generating the speech signals which is gradually decreased to approximately the speech encoding rate.

16. (Currently Amended) The wireless communication device of claim 11 wherein processing element processes the decoded speech packets with a dynamic time warping process to generate speech signals representative of the initial portion of the speech packets, the speech signals spanning a shorter time duration than the initial portion of the speech packets and having substantially preserved pitch attributes of the initial portion of the speech packets, and

wherein the dynamic time warping process compensates for an increased pitch resulting from initially generating the speech signals at the rate exceeding the speech encoding rate.

- 17. (Currently Amended) The wireless communication device of claim 11 wherein the communication device receives the initial portion of the speech packets at a transmission rate and the voice decoder performs the decoding at approximately the transmission rate.
- 18. (Currently Amended) The wireless communication device of claim 11 wherein the speech packets are received through a wireless communication channel that is granted through [[an]]a wireless access medium, and

wherein the speech packets are buffered during the channel reallocation delay until the wireless communication channel is granted, the access channel having a bandwidth exceeding the speech encoding rate.

19. (Currently Amended) The wireless communication device of claim 18 wherein the

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wireless communication channel has a bandwidth that is of the access channel is approximately proportional to an inverse of the channel reallocation delay.

- 20. (Currently Amended) The <u>wireless</u> communication device of claim [[11]] <u>12</u> wherein the speech packets are received through <u>a wireless</u> [[an]] access medium that includes at least one of a wireless communication medium, a fiber optical medium, and a conductive wired medium.
- 21. (Currently Amended) The <u>wireless</u> communication device of claim [[20]] <u>11</u> wherein when the access medium is a fiber optical medium, the communication device includes a demultiplexer to demultiplex received speech packets that are at least one of wavelength multiplexed, frequency division multiplexed and time division multiplexed the speech signals correspond to actual audio signals that are to be heard by a person listening.
- 22. (Currently Amended) The <u>wireless</u> communication device of claim 20 wherein when the access medium is a wireless communication medium, the communication device is a wireless communication device having a receiver to receive the speech packets that are employs at least one of spread spectrum multiplexed, frequency division multiplexed and or time division multiplexed communication signals.
- 23. (Currently Amended) A system <u>for</u> communicating voice <u>over a wireless</u> <u>communication channel</u> comprising:

a voice encoder to encode outbound speech packets at a speech encoding rate;
an output buffer to store the encoded outbound speech packets until a wireless
communication channel is allocated for the transmission of the encoded outbound speech
packets;

a voice decoder to decode speech packets <u>received through the wireless communication</u> <u>channel</u>, at least an initial portion of the speech packets being delayed by a channel reallocation delay;

a decoder buffer to store the decoded speech packets; and

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a processing element to generate speech signals from process the decoded speech packets at a varying rate initially exceeding [[a]] the speech encoding rate to compensate for a channel allocation delay, and to decrease the varying rate to the speech encoding rate, wherein the speech signals are to generate speech signals representative of at least the initial portion of the speech packets, the speech signals having and have a shortened time period which compensates for the channel reallocation allocation delay.

24. (Currently Amended) The system of claim 23 wherein the speech signals correspond to actual audio signals that are to be heard by a person listening. further comprising:

a voice encoder to encode outbound speech packets; and

an output buffer to store outbound speech packets until a channel is reallocated for the transmission of the outbound speech packets.

- 25. (Currently Amended) The system of claim 24 further comprising a media access controller to receive inbound speech packets from [[an]] a wireless access medium, to transfer outbound speech packets to the access medium and to request allocation of the wireless communication an access channel for transmission of the outbound speech packets through the wireless access medium.
- 26. (Currently Amended) The system of claim 25 wherein the voice encoder encodes the outbound speech packets at the speech encoding rate and wherein the media access controller sends the outbound speech packets through the <u>wireless</u> access medium at a rate exceeding the speech encoding rate, and

wherein the processing element processes the decoded inbound speech packets to generate the speech signals at a rate which initially exceeds the speech encoding rate and which is gradually decreased to approximately the speech encoding rate.

27. (Currently Amended) The system of claim 26 wherein processing element processes the decoded inbound speech packets with a dynamic time warping process to generate speech signals representative of the initial portion of the inbound speech packets, the speech signals

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spanning a shorter time duration than the initial portion of the inbound speech packets and having substantially preserved pitch attributes of the initial portion of the inbound speech packets, and

wherein the dynamic time warping process compensates for an increased pitch resulting from initially generating the speech signals at the rate exceeding the speech encoding rate.

28. (Currently Amended) The system of claim [[27]] 23 wherein the voice decoder, the decoder buffer, and the processing element, are part of a receiving wireless communication device, and

wherein the voice encoder, and the output buffer and media access controller are part of a transmitting two-way wireless communication device.